WE CLAIM:

1. A beverage dispensing apparatus, comprising:

a dispensing device;

at least one valve distributing diluent;

a concentrate pump distributing concentrate;

a support structure supporting said dispensing device, said at least one diluent valve, and said concentrate pump; and

exterior cladding attached to said support structure, said exterior cladding providing the appearance of a real brewer,

wherein said at least one diluent valve and said concentrate pump distribute the diluent and concentrate, respectively, into said dispensing device to form a mixture that is dispensed from said dispensing device.

2. An apparatus according to Claim 1, further comprising:

a reservoir containing the concentrate;

a sensor that detects when the concentrate in said reservoir is depleted, said concentrate pump drawing the concentrate from said reservoir through said sensor;

a hot water tank;

a heating source in said hot water tank that heats water in said hot water tank as a diluent; and

an air ejector assembly that removes air from hot water distributed by said at least one diluent valve,

wherein said at least one diluent valve distributes hot water from said hot water tank.

3. An apparatus according to Claim 2, further comprising a controller that (a) controls said at least one diluent valve and said concentrate pump to respectively control distribution of the diluent and the concentrate; (b) controls said sensor to detect when the concentrate in said reservoir is depleted; and (c) controls said heating source to heat the water in said hot water tank.

4. An apparatus according to Claim 1, wherein said dispensing device comprises a mixing chamber and a dispensing nozzle,

wherein said at least one diluent valve and said concentrate pump distribute the diluent and concentrate, respectively, into said mixing chamber to form the mixture, and

wherein said mixture is dispensed from said dispensing nozzle.

5. An apparatus according to Claim 4, wherein said dispensing device further comprises:

at least one inlet port provided in said mixing chamber;

a lever;

an actuator connected to said lever; and

a microswitch that controls said at least one diluent valve and said concentrate pump, said microswitch opening said at least one diluent valve and operating said concentrate pump to respectively distribute the diluent and concentrate to said mixing chamber through said at least one inlet port when said microswitch is closed, and said microswitch closing said diluent valve and stopping the operation of said concentrate pump when said microswitch is open,

wherein a normal position of said microswitch is the open position, and

wherein activation of said lever moves said actuator to close said microswitch.

6. An apparatus according to Claim 5, wherein said at least one inlet port comprises a first inlet located at a rear entrance of said mixing chamber, and a second inlet located between said first inlet and said dispensing nozzle,

wherein the diluent comprises hot and cold water, and

wherein the hot water, the concentrate, and cold water are distributed into said mixing chamber through said first and second inlets.

7. An apparatus according to Claim 6, wherein said second inlet is angled with respect to said mixing chamber.

8. An apparatus according to Claim 7, wherein said dispensing device further comprises a check valve provided at at least one of a junction of said mixing chamber with said first inlet and a junction of said mixing chamber with said second inlet

9. An apparatus according to Claim 5, wherein a hydraulic diameter of said mixing chamber gradually reduces from a rear portion of said mixing chamber to the exit of said mixing chamber.

10. An apparatus according to Claim 1, further comprising:

a reservoir containing the concentrate; and

a sensor that senses a depleted condition of said reservoir,

wherein said concentrate pump draws the concentrate from said reservoir through said sensor.

11. An apparatus according to Claim 10, wherein said sensor comprises:

a chamber;

an electrode assembly provided in said chamber;

an inlet port provided in said chamber;

an equalizing port provided in said chamber at an elevation no lower than an elevation of said inlet port; and

an outlet port provided in said chamber at an elevation that is lower than the elevation corresponding to said inlet port.

12. An apparatus according to Claim 11, wherein said electrode assembly comprises:

a first electrode provided in a dielectric material and having an exposed portion extending out of the dielectric material; and

a second electrode provided in the dielectric material and having an exposed portion extending out of the dielectric material,

wherein the elevations of said equalizing port and said inlet part are equal,

wherein said first and second electrodes extend below the elevation corresponding to said inlet port, and

wherein said sensor further comprises a control circuit that monitors an impedance across said first and second electrodes.

13. An apparatus according to Claim 12, wherein the exposed portion of said first electrode is provided below the elevation corresponding to said inlet port, and

wherein the exposed portion of said second electrode begins above the elevation corresponding to said inlet port and extends below the elevation corresponding to said inlet port.

14. An apparatus according to Claim 11, wherein said electrode assembly comprises:

a first electrode provided in a dielectric material and having an exposed portion extending out of the dielectric material; and

a second electrode provided in the dielectric material and having an exposed portion extending out of the dielectric material,

wherein the elevation of said equalizing port is higher than the elevation of said inlet port,

wherein the first and second electrodes extend below the elevation of said equalizing port and above the elevation of said inlet port, and

wherein said sensor further comprises a control circuit that monitors an impedance across said first and second electrodes.

15. An apparatus according to Claim 14, wherein said inlet port is aligned below said equalizing port.

16. An apparatus according to Claim 1, further comprising:

a hot water tank; and

a heating source that heats water in said hot water tank as a diluent,

wherein said at least one diluent valve distributes hot water from said hot water tank.

17. An apparatus according to Claim 16, wherein said hot water tank operates at atmospheric pressure.

18. An apparatus according to Claim 16, wherein said heating source comprises a 750 kW heating element provided in said hot water tank.

19. An apparatus according to Claim 16, further comprising an air ejector assembly that removes air from the hot water distributed by said at least one diluent valve.

20. An apparatus according to Claim 19, wherein said air ejector assembly comprises:

a liquid chamber;

an inlet provided in said chamber; and

an outlet provided in said chamber,

wherein said outlet is provided in said chamber at a lower elevation than said inlet,

wherein the hot water enters said chamber through said inlet and exits said chamber through said outlet, and

wherein air in the hot water separates from the hot water and rises to an upper portion of said chamber.

21. An apparatus according to Claim 20, wherein said air ejector assembly further comprises:

an opening in the upper portion of said chamber,

wherein air that rises to the upper portion of said chamber is exhausted from said chamber through said opening.

22. An apparatus according to Claim 21, wherein said air ejector assembly further comprises:

a check valve in the upper portion of said chamber that prevents the hot water from escaping said chamber through said opening, said check valve comprising a restricting device, which floats on a surface of the hot water in said chamber, and a sealing member,

wherein said restricting device engages said sealing member to block said opening when the surface of the hot water in said chamber rises toward said opening.

23. An apparatus according to Claim 22, wherein said sealing member comprises an o-ring.

24. An apparatus according to Claim 19, further comprising a controller that controls said air ejector assembly to automatically drain hot water from said air ejector assembly through said dispensing device at predetermined intervals.

25. An apparatus according to Claim 1, further comprising a controller that controls said at least one diluent valve and said concentrate pump to respectively control distribution of the diluent and the concentrate.

26. An apparatus according to Claim 25, wherein said controller controls said diluent valve to purge said dispensing device at predetermined intervals.

27. An air ejector assembly, comprising:

a liquid chamber;

an inlet provided in said chamber; and

an outlet provided in said chamber,

wherein said outlet is provided in said chamber at a lower elevation than said inlet,

wherein liquid enters said chamber through said inlet and exits said chamber through said outlet, and

wherein air in the liquid separates from the liquid and rises to an upper portion of said chamber.

28. An air ejector assembly according to Claim 27, further comprising:

an opening in the upper portion of said chamber,

wherein air that rises to the upper portion of said chamber is exhausted from said chamber through said opening.

29. An air ejector assembly according to Claim 28, further comprising:

a check valve in the upper portion of said chamber that prevents the liquid from escaping said chamber through said opening.

30. An air ejector assembly according to Claim 29, wherein said check valve comprises a restricting device that floats on a surface of the liquid in said chamber,

wherein said restricting device blocks said opening when the surface of the liquid in said chamber rises toward said opening.

31. An air ejector assembly according to Claim 30, wherein said restricting device comprises a floating ball,

wherein said check valve further comprises a sealing member, and

wherein said floating ball engages said sealing member to block said opening when the surface of the liquid in said chamber rises toward said opening.

32. An air ejector assembly according to Claim 31, wherein said sealing member comprises an o-ring.

33. An air ejector assembly according to Claim 27, wherein the liquid comprises hot water heated in a hot water heater at atmospheric pressure.

34. A dispensing device, comprising:

a mixing chamber;

at least two inlet ports provided in said mixing chamber; and

a dispensing nozzle provided at an exit of said mixing chamber,

wherein at least two liquids enter said mixing chamber through said at least two inlet ports and are dispensed through said dispensing nozzle, and

wherein said dispensing device has an external appearance of a dispensing device of a real brewer.

35. A dispensing device according to Claim 34, further comprising:

a lever;

an actuator connected to said lever; and

a microswitch that controls flow of the at least two liquids entering said mixing chamber through said at least two inlet ports, said microswitch allowing the at least two liquids to enter said mixing chamber through said at least two inlet ports when said microswitch is closed, and said microswitch preventing the at least two liquids from entering said mixing chamber through said at least two inlet ports when said microswitch is open,

wherein a normal position of said microswitch is the open position, and

wherein activation of said lever moves said actuator to close said microswitch.

36. A dispensing device according to Claim 35, wherein said at least two inlets comprise a first inlet located at a rear entrance of said mixing chamber, and a second inlet located between said first inlet and said dispensing nozzle.

37. A dispensing device according to Claim 34, wherein said second inlet is angled with respect to said mixing chamber.

38. A dispensing device according to Claim 37, further comprising a check valve provided at at least one of a junction of said mixing chamber with said first inlet and a junction of said mixing chamber with said second inlet.

39. A dispensing device according to Claim 34, wherein a hydraulic diameter of said mixing chamber gradually reduces from a rear portion of said mixing chamber to the exit of said mixing chamber.

40. A dispensing device according to Claim 34, wherein a composition of said dispensing device comprises an antibacterial agent.

41. A dispensing device according to Claim 34, wherein the at least two liquids entering said mixing chamber comprise concentrate, hot water, and cold water.

42. A dispensing device according to Claim 41, wherein the at least two liquids entering said mixing chamber further comprise an additive.

43. A dispensing device according to Claim 34, wherein the at least two liquids entering said mixing chamber comprise cold water and a pre-mixed solution of concentrate and hot water.

44. A dispensing device according to Claim 34, wherein the at least two liquids entering said mixing chamber comprise a pre-mixed solution of concentrate and hot water, and a solution of cold water and an additive.

45. A dispensing device according to Claim 34, wherein the at least two liquids entering said mixing chamber comprise concentrate, hot water, and cold water, and

wherein said at least two inlets comprise a first inlet for the concentrate, a second inlet for the hot water, and a third inlet for the cold water.

46. A dispensing device according to Claim 34, wherein the at least two liquids entering said mixing chamber comprise concentrate, hot water, cold water, and an additive, and

wherein said at least two inlets comprise a first inlet for the concentrate, a second inlet for the hot water, a third inlet for the cold water, and a fourth inlet for the additive.

47. A sensor for sensing a depleted condition of a fluid source, comprising:

a chamber;

an electrode assembly provided in said chamber;

an inlet port provided in said chamber for receiving fluid from the fluid source;

an equalizing port provided in said chamber at an elevation no lower than an elevation of said inlet port; and

an outlet port provided in said chamber at an elevation that is lower than the elevation corresponding to said inlet port.

48. A sensor according to Claim 47, wherein said electrode assembly comprises:

a first electrode provided in a dielectric material and having an exposed portion extending out of the dielectric material; and

a second electrode provided in the dielectric material and having an exposed portion extending out of the dielectric material,

wherein the elevations of said equalizing port and said inlet port art equal,

wherein said first and second electrodes extend below the elevation corresponding to said inlet port, and

wherein said sensor further comprises a control circuit that monitors an impedance across said first and second electrodes.

49. A sensor according to Claim 48, wherein the exposed portion of said first electrode is provided below the elevation corresponding to said inlet port, and

wherein the exposed portion of said second electrode begins above the elevation corresponding to said inlet port and extends below the elevation corresponding to said inlet port.

50. A sensor according to Claim 47, wherein said electrode assembly comprises:

a first electrode provided in a dielectric material and having an exposed portion extending out of the dielectric material; and

a second electrode provided in the dielectric material and having an exposed portion extending out of the dielectric material,

wherein the elevation of said equalizing port is higher than the elevation of said inlet port,

wherein the first and second electrodes extend below the elevation of said equalizing port and above the elevation of said inlet port, and

wherein said sensor further comprises a control circuit that monitors an impedance across said first and second electrodes.

51. A sensor according to Claim 50, wherein said inlet port is aligned below said equalizing port.

52. A sensor according to Claim 47, further comprising an equalizing line that connects said equalizing port to said outlet port,

wherein a diameter of said equalizing line restricts flow of the fluid therethrough during normal operation.

53. A beverage dispensing apparatus, comprising:

dispensing means for dispensing a beverage;

at least one diluent distributing means for distributing diluent;

concentrate distributing means for distributing concentrate;

support means for supporting said dispensing means, said at least one diluent distributing means, and said concentrate distributing means; and

exterior cladding attached to said support means, said exterior cladding providing the appearance of a real brewer,

wherein said at least one diluent distributing means and said concentrate distributing means distribute the diluent and concentrate, respectively, into said dispensing means to form a mixture that is dispensed from said dispensing means.

54. An apparatus according to Claim 53, further comprising:

a fluid source containing the concentrate;

sensor means for detecting when the concentrate in said fluid source is depleted, said concentrate distributing means drawing the concentrate from said fluid source through said sensor means;

heating means for heating water to provide the hot water as a diluent; and

air ejector means for removing air from the hot water heated by said heating means,

wherein said at least one diluent distributing means distributes hot water from said heating means.

55. An apparatus according to Claim 53, wherein said dispensing means comprises:

mixing means for mixing the diluent and concentrate;

at least one inlet port provided in said mixing means;

switch activation means; and

switch means for controlling said at least one diluent distributing means and said concentrate distributing means to distribute the diluent and concentrate, respectively, to said mixing means through said at least one inlet port when said switch means is closed, and to stop distribution of the diluent and concentrate when said switch means is open,

wherein a normal position of said switch means is the open position, and

wherein activation of said switch activation means moves said switch means to the closed position.

56. An apparatus according to Claim 55, wherein said at least one inlet port comprises a first inlet located at a rear entrance of said mixing means, and a second inlet located between said first inlet and an exit of said mixing means,

wherein the diluent comprise hot and cold water, and

wherein the hot water, the concentrate, and cold water are distributed into said mixing means through said first and second inlets.

57. An apparatus according to Claim 56, wherein said second inlet is angled with respect to said mixing means.

58. An apparatus according to Claim 53, wherein a hydraulic diameter of said mixing means gradually reduces from an entrance of said mixing means to the exit of said mixing means.

59. An apparatus according to Claim 53, further comprising:

a fluid source containing the concentrate; and

sensor means for sensing a depleted condition of said fluid source,

wherein said concentrate distributing means draws the concentrate from said fluid source through said sensor means.

60. An apparatus according to Claim 53, further comprising:

heating means for providing hot water as a diluent,

wherein said at least one diluent distributing means distributes hot water from said heating means.

61. An apparatus according to Claim 53, further comprising,

air ejector means for removing air from hot water distributed as a diluent by said at least one diluent distributing means.

62. An apparatus according to Claim 61, wherein hot water from said air ejector means is automatically drained through said dispensing means at predetermined intervals.

63. A method of ejecting air from a liquid dispensing system, comprising:

distributing a liquid at a first elevation into a liquid chamber;

removing the liquid at a second elevation from the liquid chamber, the second elevation being lower than the first elevation; and

exhausting air from an opening in an upper portion of the chamber.

64. A method according to Claim 63, further comprising the step of preventing the liquid from escaping the chamber through the opening in the upper portion of the chamber.

65. A method according to Claim 63, further comprising the step of heating the liquid in a heater at atmospheric pressure before distributing the liquid into the liquid chamber.

66. A method for heating a liquid in a reservoir, comprising:

applying heat in the reservoir;

measuring a temperature increase rate in the reservoir;

comparing the temperature increase rate measured in said measuring step to a known temperature increase rate for the liquid in the reservoir to determine if the measured temperature increase rate is greater than the known temperature increase rate by a predetermined amount; and

stopping said heat applying step when the measured temperature increase rate is greater than the known temperature increase rate by the predetermined amount.

67. A method according to Claim 66, wherein the predetermined amount is in the range of about 25% to about 33%.

68. A beverage dispensing apparatus, comprising:

first and second dispensing devices;

a single hot water heater for heating water for supply to said first and second dispensing devices;

at least one concentrate pump distributing concentrate;

first and second water inlet valves for controlling water supply to said hot water heater;

first and second hot water outlet valves for controlling discharge of hot water from said hot water heater to said first and second dispensing devices, respectively; and

a controller for controlling at least said first and second water inlet valves and said first and second hot water outlet valves.

69. An apparatus according to claim 68, wherein when said first dispensing device is actuated, said controller controls said first water inlet valve to open and said first hot water outlet valve to open, and when said second dispensing device is actuated, said controller controls said second water inlet valve and said second hot water outlet valve to open.

70. An apparatus according to claim 69, wherein the flow of water through said first water inlet valve and said first hot water outlet valve are equal at any given time.

71. An apparatus according to claim 68, further comprising first and second concentrate pumps, wherein when said first dispensing device is actuated, said first concentrate pump is actuated and when said second dispensing device is actuated, said second concentrate pump is actuated.

72. An apparatus according to claim 68, further comprising a support structure supporting said first and second dispensing devices, said first and second water inlet valves and said first and second hot water outlet valves, and exterior cladding attached to said support structure, said exterior cladding providing the appearance of a real brewer.

73. An apparatus according to claim 68, further comprising first and second mixing passages disposed between said first and second hot water outlet valves and said first and second dispensing devices, respectively, said first and second mixing passages allowing the hot water and concentrate to intermix for a predetermined residence time.

74. An apparatus according to claim 73, wherein the predetermined residence time is determined by at least one of varying the length of, varying the internal diameter of, or crimping said first and second mixing passages.